INTRODUCTION

On April 30, 1997, the U.S. Fish and Wildlife Service (Service) issued a Biological and Conference Opinion on the U.S. Bureau of Reclamation's (Reclamation) routine operations and maintenance of the Lower Colorado River from Lake Mead to the Southerly International Boundary between the United States and Mexico (USFWS, 1997) (Figure 1). In this opinion, the Service stated that Reclamation's proposed action for operation and maintenance of facilities on the Lower Colorado River is likely to jeopardize the continued existence of several species, including the endangered southwestern willow flycatcher (*Empidonax traillii extimus*). The Reasonable and Prudent Alternative (RPA), authored by the Service as part of this Biological Opinion, includes both short and long-term provisions for the recovery of the southwestern willow flycatcher along the Lower Colorado River. Concurrently, a Multi-Species Conservation Program (MSCP), comprised of federal, state, and private organizations, has been initiated with the goal of producing and implementing a plan for the conservation of over 100 species along the Lower Colorado River over the next fifty years.

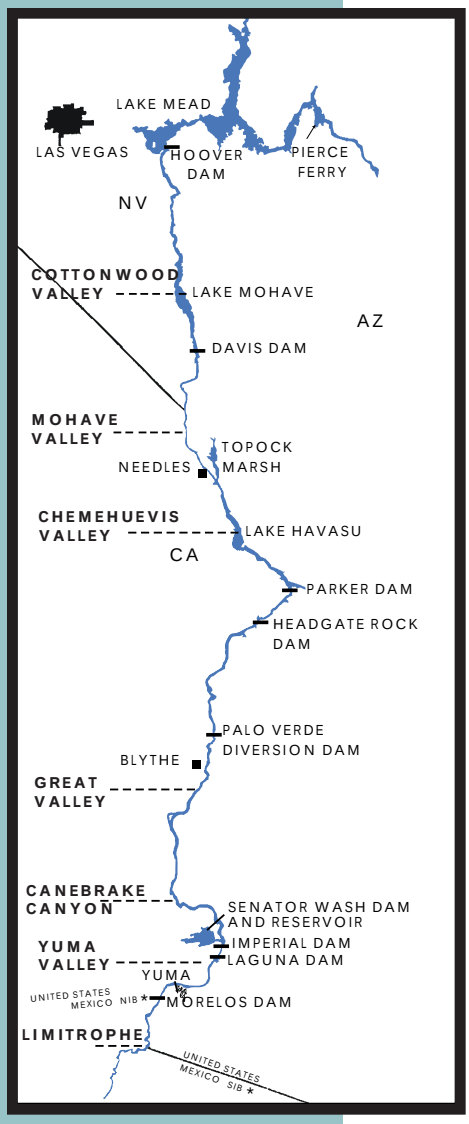

Figure 1. Map of the Lower Colorado River.

Two provisions of the RPA deal with the short and long-term protection, enhancement, restoration, and acquisition of southwestern willow flycatcher habitat. RPA#5 directs Reclamation to protect, enhance, or restore 1400 acres of southwestern willow flycatcher breeding habitat by January 1, 2001 (USFWS, 1997) (Appendix A). Efforts are currently underway to identify occupied or potential habitat within the southwestern willow flycatcher breeding range where Reclamation can meet this goal. In order to meet RPA#11, Reclamation has submitted this report to the MSCP identifying the historical number of acres of *potentially suitable* southwestern willow flycatcher habitat and offering potential areas for the protection, restoration, enhancement, or acquisition of breeding habitat (USFWS, 1997) (Appendix A).

SPECIES DESCRIPTION AND LIFE REQUISITES

The willow flycatcher is one of ten species in the genus Empidonax found in North America. Empidonax flycatchers are renowned for their physical similarities and, thus, for the difficulty in identifying individuals in the field (Phillips et al., 1964; Peterson, 1990; Tibbitts et al., 1994). *Empidonax traillii* is further divided taxonomically into five subspecies (USFWS, 1997). The southwestern willow flycatcher (*E. t. extimus*), one of three subspecies found in the western United States, is a smallish bird measuring approximately 5.75 inches and weighing less than 0.5 ounces. It has a grayish-green back and wings, whitish throat, light olive-grey breast, and pale body. Two

white wing bars are visible. The upper mandible is dark, the lower light. The most distinguishable taxonomic characteristic of willow flycatchers is the absent or faintly visible eye ring. Recognition of subspecies in the field is exceedingly difficult, if not impossible. Subspecies differentiation has been based on subtle differences in color and morphology, using museum specimens (Unitt, 1987; Unitt, 1997; McKernan and Braden, 1998).

The southwestern willow flycatcher is a neotropical migrant. All subspecies of willow flycatcher winter in Mexico, Central America, and possibly northern South America (Peterson, 1990; Tibbitts et al., 1994). The exact wintering grounds of the *E. t. extimus* are unknown, at this time (Sogge et al., 1997; Unitt, 1997). Southwestern willow flycatchers may begin to arrive in breeding territory as early as late April and may continue to be present until August (McKernan and Braden, 1998). Migration routes are not completely known but do include drainages where breeding populations have not been documented in Arizona (USFWS, 1997). Other subspecies, including *E. t. brewsteri* and *E. t. adastus*, probably utilize identical migration corridors.

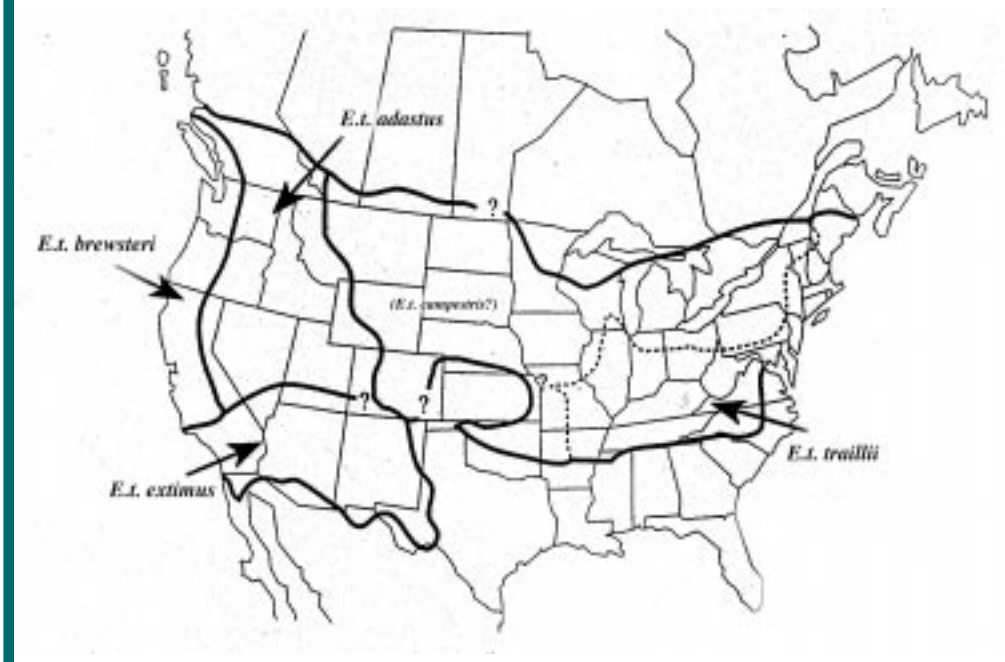

Figure 2. Approximate breeding ranges of the various races of willow flycatcher. Adapted from Unitt (1987), Browning (1993), and Tibbitts et al., 1994.

Southwestern willow flycatchers nest in riparian habitat characterized by a dense stand of intermediate sized shrubs or trees, such as willows (*Salix* sp.), *Baccharis*, buttonbush (*Cephalanthus* sp.), box elder (*Acer negundo*), or saltcedar (*Tamarix* sp.), often with an overstory of scattered large trees, such as cottonwoods (*Populus fremontii*) or willows. They may begin nesting in May and continue through July (Tibbitts et al., 1994; McKernan and Braden, 1998). Typically, southwestern willow flycatchers raise one brood per year but have been documented to produce more than one brood during a season (Whitfield, 1990; McKernan, per. comm.). Brood parasitism by brown-headed cowbirds (*Molothrus ater*) has been documented throughout the range of the southwestern willow flycatcher and has been blamed for reducing flycatcher breeding success (Unitt, 1987; Brown, 1988; Rosenberg et al., 1991; Sogge et al., 1993; Muizieks et al., 1994; USFWS, 1997). Breeding territory for the southwestern willow flycatcher extends from extreme southern Utah and Nevada, through Arizona, New Mexico, southern California, and west Texas to extreme northern Baja California and Sonora, Mexico (Unitt, 1987) (Figure 2).

Description of breeding habitat

The southwestern willow flycatcher is a riparian obligate occurring in habtats characterized by dense stands of intermediate sized vegetation, usually with water or moist soil present beneath the canopy. The Biological Opinion (USFWS, 1997) has identified five general habitat types utilized by nesting southwestern willow flycatchers range wide:

I) "monotypic, dense stands of willow (often *S. exigua* or *S. geyeriana* above 7000 feet in Arizona) 9 to 20 feet in height with no distinct overstory; difficult to penetrate; vertical foliage density uniformly high (>60%) from ground to canopy."

II) "monotypic, dense stands of saltcedar 12 to 35 feet in height forming a nearly continuous, closed canopy (i.e., no distinct overstory); vertical foliage density increases with height; canopy density uniformly high (approx. 90%); difficult to penetrate."

III) "dense stands of mostly Goodding's willow 12 to 40 feet in height characterized by trees of different size classes, a distinct overstory, subcanopy strata, fallen but living trees creating dense tangles difficult to penetrate."

IV) "dense mixtures of native broadleaf trees and shrubs including cottonwood, box elder, ash, buttonbush, and stinging nettle, characterized by a distinct overstory of cottonwood or willow with subcanopies and a dense understory of mixed species also difficult to penetrate."

V) "dense mixtures of native broadleaf trees and shrubs as in number 4 above mixed with exotics such as saltcedar or Russian olive primarily in the understory; dense ground-level tangles difficult to penetrate sometimes interspersed with small openings."

Other site characteristics may be important; however, most are poorly understood. Occupied patch size and shape can vary significantly, with areas as small as 0.6 hectares being utilized (M. Sogge, per. comm.). It appears, however, that linear habitats only one or two trees wide do not provide suitable nesting habitat for the southwestern willow flycatcher (USFWS, 1997). Other factors, including parasitism, predation, prey preferences and abundance, abiotic conditions (i.e., temperature, humidity), and population dynamics (i.e., site fidelity, distribution of breeding populations, dispersal, demography) are not fully understood and may affect breeding success. Studies are ongoing in an effort to further quantify habitat quality.